

## The *Chrysogaster* species (Dipt. Syrphidae) known in Great Britain and Ireland

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Five species of *Chrysogaster* s.s are known both in Great Britain and Ireland. The keys available for distinguishing *Chrysogaster* species from one another, or from species of the closely related genera *Lejogaster* and *Orthonevra*, are difficult to interpret. In particular, the *Chrysogaster* species with black antennae are at present all too easily confused with each other, and their females could be misdetermined as species of the other genera involved. Further, if the common continental species *C. viduata* were to occur here, its presence could easily be overlooked.

### Distinctions between *Chrysogaster*, *Lejogaster* and *Orthonevra*

The males of *Chrysogaster* species can easily be distinguished from those of *Lejogaster*: in *Lejogaster* the males are dichoptic whereas in *Chrysogaster* they are holoptic. Distinctions from *Orthonevra* males are less easy to describe (differences between *Orthonevra* species are in any case such as to suggest that the validity of this genus as a monophyletic group remains open to question). *O. splendens* males entirely lack a facial tubercle, the area between antennae and upper mouth edge being quite flat (see fig. 1a). Although the other *Orthonevra* species do not possess a facial tubercle, whereas (in the male) all *Chrysogaster* species do (including *C. viduata*), when examined in profile *Orthonevra* males (especially *O. brevicornis*, see fig. 1b) not infrequently appear to possess a facial tubercle. Equally, when examined in profile *C. chalybeata* males seem to be virtually without a facial tubercle (see fig. 1c). If examined from above it will be seen that *Orthonevra* are without a facial tubercle, the appearance of a facial tubercle in side view being due to a shallow transverse cleft which interrupts the downward sweep of the face just above the projecting upper mouth edge (see fig. 1d). The seeming absence of a facial tubercle in *C. chalybeata* males is due to the fact that in this species the tubercle is expanded into a broad ridge running right across the face from one eye to the other (see fig. 1e). Males of *C. solstitialis* also approach this condition. The simple facial tubercle found in the males of the other *Chrysogaster* species is typified by that of *C. hirtella* (see fig. 1f). *O. splendens* males also possess a post-coxal bridge behind the hind coxae, a feature absent in the males of the other *Orthonevra* species and absent in *Chrysogaster*.

Females of *Lejogaster* species possess a post-coxal bridge behind the hind coxae, which serves to distinguish them from females of the *Chrysogaster* species occurring here (and from *C. viduata*), there being no post-metacoxal bridge in *Chrysogaster*.

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Females of *O. splendens* are distinct from those of all the *Chrysogaster* species known from Great Britain and Ireland (and *C. viduata*) in their possession of a pair of well-marked stripes (golden from some angles, grey from others) running from front to back of the mesonotum: no such stripes are present in the females of the *Chrysogaster* species keyed out here. The females of the other three *Orthonevra* species known in these islands have a well-marked median tubercle (very small in *O. brevicornis*) on the apical margin of tergite 4, there being no such tubercle in the females of *Chrysogaster*.

### Distinctions between *Chrysogaster* species

According to Coe (1953) *Chrysogaster* species fall into two groups based on antennal colour, the one group possessing red antennae, the other black antennae. Unfortunately, those with "red" antennae often have antennae which can at most be described as red-brown, if not simply as brown, while in those species with "black" antennae (*C. hirtella* and *C. macquarti*, also *C. viduata*), the antennae can be distinctly brown. *C. hirtella* and *C. macquarti* are traditionally separated (see Collin, 1931; Coe, 1953) by differences in the facial profile and colouration of the mesonotal hair covering. However, the character of the facial profile varies sufficiently in these two species for there to be a significant degree of overlap, likewise the colouration of the mesonotal hairs.

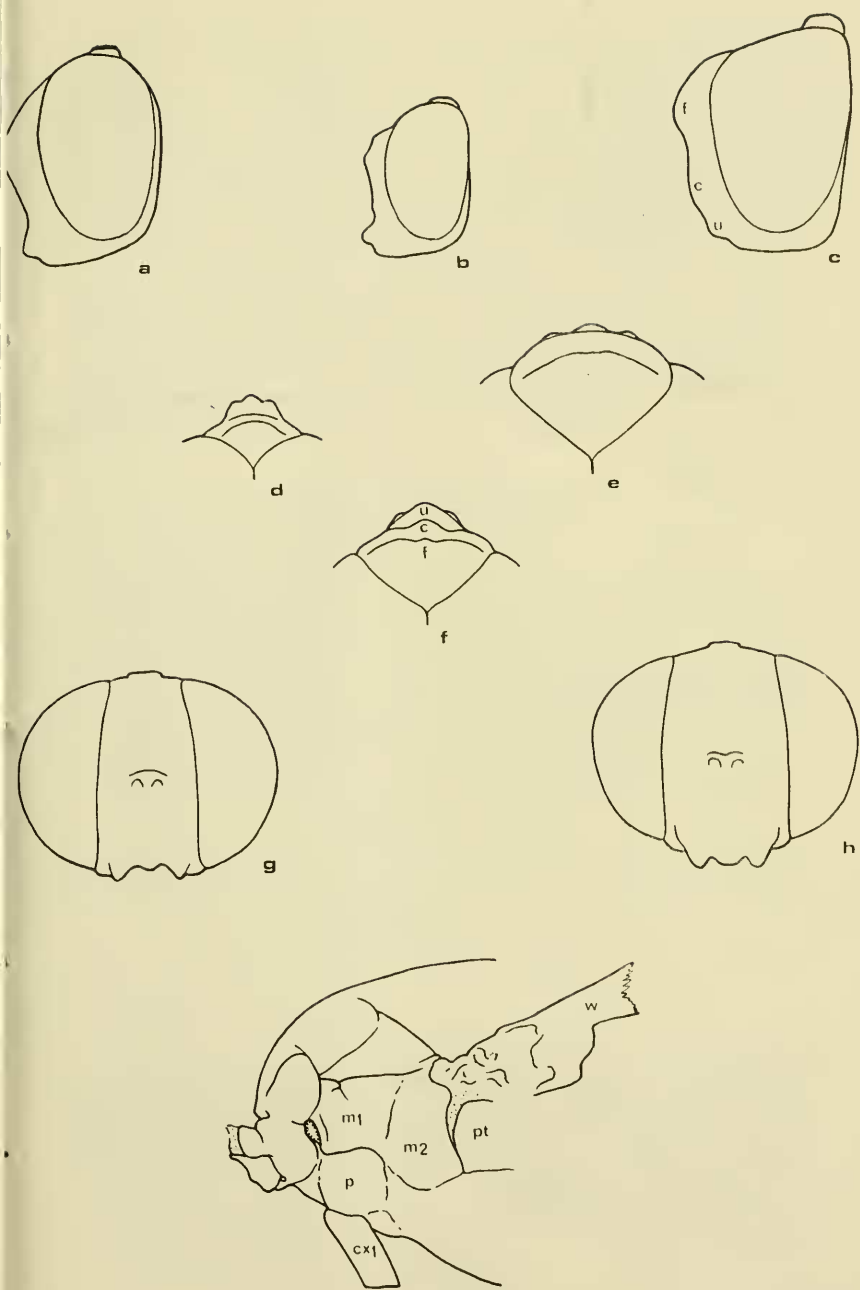
An important feature in separating *C. solstitialis* from the other species with "red" antennae is the high degree of infuscation of its wings. But the wings of *C. virescens* are darkened as much as are those of many specimens of *C. solstitialis*. The antennae can also be particularly dark in *C. virescens*, so that the female especially can be confused with *C. hirtella*, whose antennae are often brown. A further complication is that *C. hirtella* is widely distributed, frequently abundant where found and apparently partially divoltine, factors which, when coupled with the variability of this species, the fact that rarer species often occur in company with it and the confusion inherent in the keys, are likely to lead to specimens of *C. hirtella* being consigned to more than one of the other, rarer species and vice versa.

*C. viduata* is a common continental *Chrysogaster* rather similar to *C. hirtella*. It has therefor been incorporated into the following key.

#### Legend

Fig.1: *Chrysogaster* and *Orthonevra*, characteristics of head and thorax. (a) *O. splendens* ♂, head, side-view; (b) *O. brevicornis*, idem; (c) *C. chalybeata* idem; (d) *O. brevicornis* ♂, face from above; (e) *C. chalybeata* idem; (f) *C. hirtella* idem; (g) *C. solstitialis* ♀, head, front-view; (h) *C. virescens* idem; (i) *Chrysogaster* sp., thorax, side-view of anterior parts.

Abbreviations used: c = central prominence; cx<sub>1</sub> = front coxa; f = frontal prominence; m<sub>1</sub> = mesopleurite 1 (see text); m<sub>2</sub> = mesopleurite 2; p = "proepimeral area" (see text); pt = "ptero-pleuron"; u = upper mouth edge; w = wing.



i  
Fig. 1

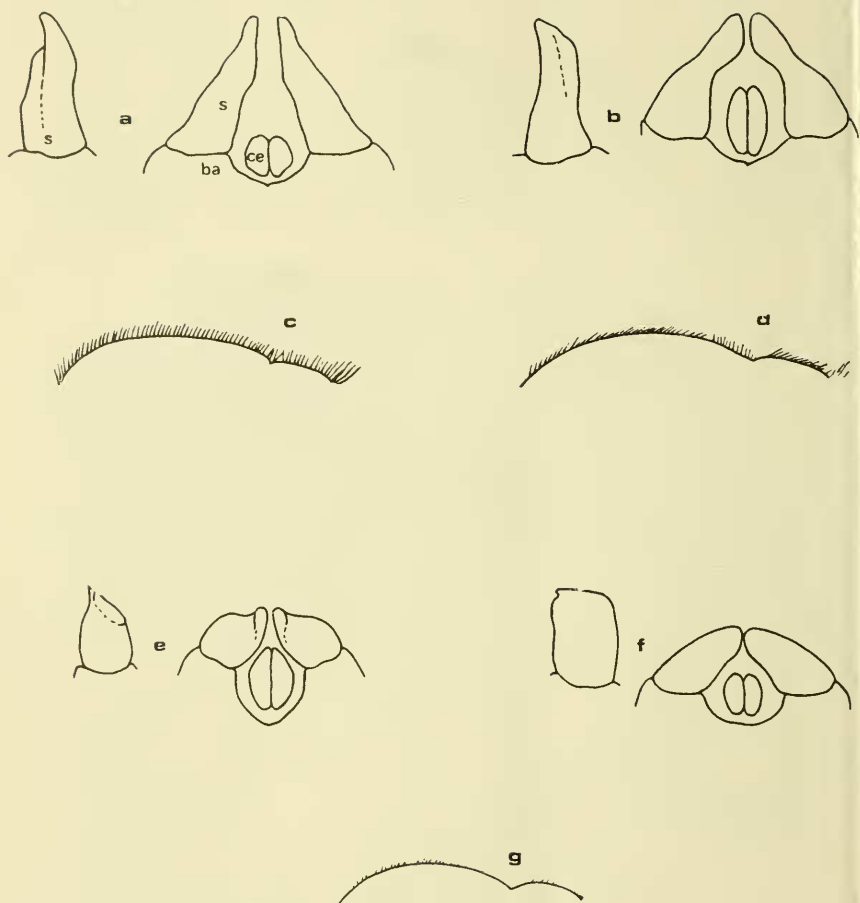


Fig. 2 a, b, e, f: *Chrysogaster* males, view of outer side of right surstylus and external view of end of epandrium, showing surstyli; a = *C. hirtella*, b = *C. macquarti*, e = *C. virescens*, f = *C. viduata* (all at same scale). c, d, g: *Chrysogaster* females, outline of mesonotal disc and scutellum near mid-line, showing character of hair covering (hair thickness not to scale); c = *C. hirtella*, d = *C. macquarti*, g = *C. viduata* (all at same scale).

Abbreviations used: ba = basale (tergite 9), ce = cercus, s = surstylus.

Fig. 2

Various parts of the thoracic pleura are mentioned in the key. The area above and behind the front coxa (p in fig. 1i) has traditionally been regarded as mesopleural in origin. It is very much open to question whether such an interpretation is reasonable, since it assumes the prothoracic epimeron to be totally absent externally. Here the potentially propleural origin of this part of the thorax is alluded to by calling it the "proepimeral area". The mesothoracic episternum ("mesopleuron" plus "sternopleuron") is externally divisible into three recognisable regions, each of which is of use taxonomically. Traditionally, two of these have been together called the "mesopleuron". These latter two areas are here called simply mesopleurites one and two. The mesothoracic epimeron is likewise externally divisible into a number of parts. The only one of these mentioned here is the "ptero-pleuron".

#### A Key to the *Chrysogaster* species of Great Britain and Ireland, plus *C. viduata*

1. ♂♂ (eyes touching above antennae) . . . . . 2
  - ♀♀ (eyes not touching) . . . . . 7
2. Proepimeral area (see fig. 1i) obviously dusted grey, dull or only slightly shining . . . . . 3
  - proepimeral area undusted, brightly shining . . . . . 4
3. Mesonotum with a distinct, median, matt-black stripe, from anterior margin to behind transverse suture; antennae black; wing-base brown; surstyli (see fig. 2f) . . . . . *viduata* (L.) (continental Europe)
  - mesonotum without a median black stripe, or with only a trace of one; antennae red/reddish-brown; wing-base yellow . . . . . *chalybeata* Mg.
4. Mesonotal disc entirely matt, black, posterior part contrasting sharply with the brightly shining, bronze scutellum; antennae red/reddish-brown; wing heavily infuscated) . . . . . *solstitialis* (Fal.)
  - mesonotal disc mostly shining, posterior part shining as much as the scutellum, even if somewhat different in colour . . . . . 5
5. Hairs on abdominal sternites (except st. 1) much shorter than those on mesonotal disc; antennae red/reddish-brown; general body colour dark bronze; surstyli, (see fig. 2e) . . . . . *virescens* Lw.
  - hairs on abdominal sternites long, as long as those on mesonotal disc; antennae dark brown/black; general body colour normally black . . . . . 6
6. Surstylus blunt-ended (see fig. 2b); mesonotum normally entirely black haired, though some yellowish or greyish hairs may be intermixed laterally . . . . . *macquarti* Lw.
  - surstyli ending in a finger-like process, which is (side view) clearly marked off from the main body of the surstylus (see fig. 2a); mesonotum usually with abundant yellowish hairs mixed in with the blackish hairs, especially laterally

- in the vicinity of the wing-bases, though these yellowish hairs may be virtually absent . . . . . *hirtella* Lw.
7. "Proepimeral area" of thorax (p in fig. 1i) dusted grey, hardly shining and thus contrasting sharply with mesopleur proper . . . . . 8
    - "proepimeral area" undusted, brightly shining like the mesopleur proper . . . . . 9
  8. Disc of tergites 3 and 4 brightly shining, not noticeably duller than side margins (mesonotal hair covering, see fig. 2g) . . . . . *viduata* (continental Europe)
    - disc of tergites 3 and 4 dull, only vaguely shining, distinctly duller than side margins . . . . . *chalybeata*
  9. Disc of mesonotum quite coarsely punctured, but apparently bare (the covering hairs are extremely short); wing membrane usually infuscated (may be almost clear in *C. virescens*) . . . . . 10
    - disc of mesonotum rather finely punctured and covered in short hairs (see fig. 2 c, d); wing membrane clear . . . . . 11
  10. Frons at level of antennae nearly twice (ratio 1.9:1.0) width of an eye at same level (see fig. 1h); mesopleurite<sub>2</sub> and pteropleur covered in short, pale (yellowish and grey) bristly hairs (a few black hairs sometimes mixed in); mesonotum brightly shining, bronze . . . . . *virescens*
    - frons at level of antennae 1½ times (ratio 1.5:1.0) width of an eye at same level (see fig. 1g); mesopleurite<sub>2</sub> and pteropleur covered in extremely short, black, bristly hairs; mesonotum rather dull, with purplish reflections . . . . . *solstitialis*
  11. Middle femora with distal half of anterior surface clothed in pale yellowish hairs; mesonotal disc with hairs on anterior half upright (see fig. 2c) . . . . . *hirtella*
    - middle femora with distal half of anterior surface clothed in black hairs; mesonotal disc with strongly reclinate hairs on anterior half (see fig. 2d) . . . . . *macquarti*

#### Brief notes on the species

The notes which follow are based largely on my own experience of these species, in various parts of Great Britain and Ireland. Information about flight period in the Netherlands, provided by Dr. v. d. Goot is also presented, since it has a bearing on the potential performance of these species in "good" years here.

*C. chalybeata* Mg.

Habitat: fen; fen meadow; fenny river margins.

Distribution: scattered throughout Ireland, Scotland and Wales; probably least common in S. England.

Flight period: a summer species, peak in July; two peaks (June, August) in continental Europe (Netherlands).

Flowers visited: *Heracleum*, *Oenanthe*, *Pimpinella saxifraga*, *Torilus japonica*.

*C. hirtella* Lw.

Habitat: damp grassland with open, wet ditches; fen; pond, river and lakeside.